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Regional Distribution of Soil Phosphorus Across Congregation-Grazing Zones of Forage-Based Pastures with Cow-Calf Operations in Florida

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ABSTRACT

The arrangement of supplemental feed, water, shelter, and their concurrent interactions with topographic features may influence the distribution of animals and their simultaneous use of pasture ' s resources. The effects of grazing and/or congregation management that control phosphorus cycling and distribution have not been sufficiently evaluated. The objectives of this study were: 1) to determine whether cattle congregation sites typical on most Florida ranches, repre-sented by water troughs and shaded areas, are more phosphorus-rich and may contribute more soluble phosphorus to surface water run-off and groundwater than other pasture locations; and 2) to assess the regional distribution of Mehlich-1 extractable soil phosphorus (MP) across congregation-grazing zones of forage-based pastures with cow-calf operations in Florida. Soil samples were collected at increasing distance from congregations structures (water troughs and shades) in established (>10 yr), grazed beef cattle pastures located in three Florida regions. Samples were col-lected in the fall and spring of 2005, 2006, and 2007, respectively; following a radial (every 90 degrees) sampling pat-terns away from the center of the congregation structures. Averaged across years, MP and soil phosphorus saturation in the congregation zones were comparable ($p \leqslant 0.05$) with MP values and soil phosphorus saturation in the grazing zones at all three Florida regions. Average MP at all three pasture locations did not exceed the crop requirement threshold of 50 mg P kg^{-1} and the water quality protection threshold of 150 mg P kg^{-1}, suggesting that congregation zones in beef cattle pastures at all three regions of Florida are not phosphorus-rich.

KEYWORDS

Beef Cattle, Congregation Structures, Congregation Zone, Grazing Zone, Total Phosphorus, Phosphorus Saturation, Nutrient Management

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